



Office of the State Actuary

# 1995-2000 Actuarial Experience Study

PERS, TRS, SERS, LEOFF, WSP

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# Table of Contents

<b>I.</b>	<b>Introduction .....</b>	<b>1</b>
<b>II.</b>	<b>Summary of Demographic Findings .....</b>	<b>1</b>
<b>III.</b>	<b>Demographic Assumptions .....</b>	<b>2</b>
	<b>General .....</b>	<b>2</b>
	<b>Mortality .....</b>	<b>2</b>
	<b>Service Retirement/Probabilities of Retirement .....</b>	<b>12</b>
	<i><b>Plan 1 .....</b></i>	<i><b>12</b></i>
	PERS .....	12
	TRS .....	14
	LEOFF .....	16
	WSP .....	18
	<i><b>Plan 2/3 .....</b></i>	<i><b>19</b></i>
	PERS .....	19
	TRS .....	21
	SERS .....	23
	LEOFF .....	25
	<b>Disability .....</b>	<b>26</b>
	PERS .....	27
	TRS .....	28
	SERS .....	29
	LEOFF .....	30
	WSP .....	31
	<b>Terminations .....</b>	<b>32</b>
	PERS .....	32
	TRS .....	34
	SERS .....	36
	LEOFF .....	38
	WSP .....	40
	<b>Termination with Vested Benefit .....</b>	<b>40</b>
	PERS .....	41
	TRS .....	41
	SERS .....	42
	LEOFF .....	42
	WSP .....	43

<b>Portability .....</b>	<b>44</b>
<b>Salary Increase .....</b>	<b>44</b>
<b>Step/longevity Salary Increase .....</b>	<b>45</b>
PERS .....	45
TRS .....	46
SERS .....	47
LEOFF .....	48
WSP .....	49
<b>Development of Average Final Compensation (AFC) .....</b>	<b>50</b>
<b>Percent Married .....</b>	<b>51</b>
PERS .....	51
TRS .....	52
SERS .....	52
LEOFF .....	53
WSP .....	53
<b>Certain and Life Annuities .....</b>	<b>53</b>
<b>Military Service Credit .....</b>	<b>54</b>
PERS .....	54
WSP .....	54
<b>Age Difference .....</b>	<b>55</b>
<b>IV. Economic Assumptions .....</b>	<b>55</b>
<b>V. Actuarial Valuation Method .....</b>	<b>56</b>
<b>VI. Impact on Contribution Rates .....</b>	<b>57</b>

# **I. Introduction**

This is a report of the findings of our study of the demographic assumptions of the major Washington State Retirement Systems for the six-year period from 1995 to 2000. The study includes the following retirement systems:

Public Employees Retirement System(PERS) Plan 1 and 2;  
Teachers Retirement System(TRS) Plans 1, 2 and 3;  
School Employees Retirement System(SERS) Plans 2 and 3;  
Law Enforcement Officers and Firefighters Retirement System Plans 1 and 2; and the  
State Patrol Retirement System.

The purposes of this experience study are to:

- Review actual experience in relation to the current actuarial assumptions;
- Develop any changes in the actuarial basis (actuarial method and actuarial assumptions) as may be indicated by such review; and

There are two distinct types of assumptions used in an actuarial valuation:

- (1) Demographic assumptions -- estimating flows of people through the system and non-economic factors that affect benefits.
- (2) Economic assumptions -- estimating the impacts of economic factors on benefits and salaries and their present values.

# **II. Summary of Demographic Findings**

## **Mortality**

Mortality of retired members has changed very little over the last six years. We expected 15,212 retiree deaths and experienced 15,093 deaths for an Actual to Expected ratio of 99.2%.

## **Retirement**

The vast majority of retirements still occur in the Plans 1. About 7% fewer occurred than anticipated. The Plans 2 &3 retirement experience has yet to develop fully. Current experience is about 73% of expected.

## **Disability**

Disabilities in all but LEOFF Plan 1 account for less than 10% of the total retirements. The experience was slightly higher than the assumption but remains low.

LEOFF 1 disabilities continue to account for about 60% of total LEOFF 1 retirements.

## **Termination**

Actual terminations were higher than expected in all systems by about 13%.

# **III. Demographic Assumptions**

## **General**

Demographic assumptions are those which can be readily established by statistical studies of past experience. All data used in this study was provided by the Department of Retirement Systems. The data used was based on the information provided for the annual actuarial valuations from 1995 to 2000.

The valuation detail files for 1995-2000 were merged to produce a single record for each person who was a member of the system during any part of the study period. Each record provides a service and salary history over the study period.

We analyzed this file for each of four causes of decrement: mortality, retirement, disability, and turnover. Our analysis revolved around ratios of actual to expected experience, both year-by-year and for the entire study period. Tables showing ratios of actual to expected experience both on the old and suggested new basis will be set out for each decrement as it is discussed.

## **Mortality**

There are four mortality bases to be reviewed: Pre-Retirement Mortality, Post-Retirement Mortality, Post-Disablement Mortality, and Beneficiary Mortality.

Individual retirement systems have insufficient data or resources to develop a complete mortality table. The Society of Actuaries periodically solicits data from a large number of retirement systems in order to develop mortality tables useful as a base for individual retirement systems.

The latest table developed by the Society is the RP-2000 Table. Although the previous table UP94 produced very good results over the last six years it is important to utilize the latest table available.

The RP2000 Table is developed from data from a wide variety of retirement systems. Individual systems covering a specific type of employee may consistently have experience above or below this average. Adjustment for this is usually accomplished by using the base table but sliding the table forward or backward when looking up the mortality for a specific age.

To adjust for a group with slightly higher mortality experience we might add one or more years to the age of the member when looking up the mortality rate in the base table. Where mortality is expected to be lower we might subtract one or more years from the age. Adding to the age is done to reflect higher expected mortality and subtracting from the age is done to reflect lower expected mortality.

### ***Pre-Retirement Mortality***

Mortality rates of active members prior to retirement age are hard to measure, very small and have limited impact on actuarial results. Many illnesses force termination of employment prior to death. Many of these deaths are never included in mortality studies of retirement systems. The liabilities associated with pre-retirement deaths are usually small.

### ***Post-Retirement Mortality***

This is most significant of mortality assumptions due to its impact on actuarial results. Defined benefit plans usually pay benefits for the life of the retiree. The longer a member lives the more benefits will be paid.

### ***Post-Disablement Mortality***

The effect of many disabilities on mortality is short-lived. Immediately following disablement, mortality is high but then lessens and over time mortality approaches that of the retiree population. A way to accommodate these trends is to use a standard table with a minimum mortality percentage. A combination of a minimum mortality level and an age set forward allows us to use a standard table to mimic disability mortality.

### ***Beneficiary Mortality***

This group includes both the beneficiaries of active duty deaths and the beneficiaries of retiree deaths. These groups are much smaller than service retirees so there is insufficient experience to differentiate their mortality experience. We will use the same table for beneficiaries as for service retirees.

### ***Comparison of Old and New Assumptions***

A mortality table is composed of the probability of death for each sex at each age. Comparing two tables directly can be difficult. One of the easiest and most meaningful ways is to compare life expectancies at each sex and age for the two tables.

A life expectancy is the average number of years a person of that sex and age is expected to live. Clearly it does not apply to any individual. Half of the people will likely die before the life expectancy and half will live longer. Life expectancies are derived from mortality tables but are not used in Actuarial Valuations. Actuaries use the mortality table directly in their studies.

***Old Assumption:*** The UP 94 Table

***New Assumption:*** The RP2000 Table

Age	Life Expectancy			
	Old Assumptions		New Assumptions	
	Male	Female	Male	Female
30	48.6	53.1	48.7	52.1
40	39.0	43.4	39.1	42.3
50	29.6	33.8	29.7	32.8
60	20.9	24.6	21.3	23.9
70	13.6	16.5	13.7	16.0
80	8.0	9.8	7.7	9.6
90	4.4	5.2	4.1	5.3

### ***Post-Retirement Mortality***

System	Age Adjustments			
	Old Assumptions		New Assumptions	
	Male	Female	Male	Female
PERS	0	0	0	0
TRS	-3	-1	-2	-2
SERS	0	0	0	-2
LEOFF	1	1	0	0
WSP	1	1	0	0

All members of TRS and female members of SERS appear to have mortality experience below the level of the basic table. This is accounted for by utilizing the table with the age of the member moved back 2 years.

<p style="text-align: center;"><i>PERS</i>  <b>Mortality Experience</b>  <b>Post-Retirement</b>  1995-2000</p>					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-54	15	15	98%	12	121%
55-59	78	65	119%	54	143%
60-64	209	217	96%	189	111%
65-69	646	677	95%	614	105%
70-74	1,039	1,099	95%	1,085	96%
75-79	1,485	1,543	96%	1,572	94%
80-84	1,709	1,688	101%	1,728	99%
85-89	1,433	1,336	107%	1,438	100%
90-94	784	708	111%	756	104%
95-99	296	231	128%	225	132%
100+	30	36	82%	30	101%
<b>Total</b>	<b>7,724</b>	<b>7,616</b>	<b>101%</b>	<b>7,703</b>	<b>100%</b>

<p style="text-align: center;"><i>TRS</i>  <b>Mortality Experience</b>  <b>Post-Retirement</b>  1995-2000</p>					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-54	9	7	122%	7	134%
55-59	45	53	86%	47	95%
60-64	149	171	87%	154	97%
65-69	271	364	75%	337	80%
70-74	418	483	87%	474	88%
75-79	543	608	89%	625	87%
80-84	713	766	93%	768	93%
85-89	979	914	107%	906	108%
90-94	901	792	114%	779	116%
95-99	338	293	115%	271	125%
100+	87	62	139%	50	173%
<b>Total</b>	<b>4,453</b>	<b>4,514</b>	<b>99%</b>	<b>4,420</b>	<b>101%</b>



<p style="text-align: center;"><i>SERS</i>  <b>Mortality Experience</b>  <b>Post-Retirement</b>  1995-2000</p>					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-54	1	1	92%	1	115%
55-59	10	9	115%	7	141%
60-64	54	60	90%	48	112%
65-69	191	229	84%	193	99%
70-74	309	377	82%	346	89%
75-79	494	556	89%	522	95%
80-84	649	645	101%	601	108%
85-89	543	515	105%	495	110%
90-94	263	251	105%	241	109%
95-99	83	59	140%	55	150%
100+	6	6	101%	5	126%
<b>Total</b>	<b>2,603</b>	<b>2,708</b>	<b>96%</b>	<b>2,515</b>	<b>104%</b>

<p style="text-align: center;"><i>LEOFF</i>  <b>Mortality Experience</b>  <b>Post-Retirement</b>  1995-2000</p>					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-54	3	6	54%	4	79%
55-59	13	16	79%	11	114%
60-64	19	31	62%	22	86%
65-69	28	54	52%	41	69%
70-74	69	73	95%	60	115%
75-79	64	68	95%	59	109%
80-84	51	46	111%	42	122%
85-89	19	22	85%	22	86%
90-94	8	6	124%	7	122%
95-99	1	1	115%	1	117%
100+	0	0	0%	0	0%
<b>Total</b>	<b>275</b>	<b>322</b>	<b>85%</b>	<b>268</b>	<b>103%</b>

<i>WSP</i>					
<b>Mortality Experience</b>					
<b>Post-Retirement</b>					
1995-2000					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-54	0	3	0%	2	0%
55-59	1	5	19%	4	27%
60-64	2	6	33%	4	46%
65-69	4	8	53%	6	70%
70-74	6	6	97%	5	119%
75-79	4	6	69%	5	79%
80-84	12	11	111%	10	122%
85-89	7	5	151%	5	153%
90-94	1	1	80%	1	79%
95-99	0	1	0%	1	0%
100+	1	0	309%	0	290%
Total	38	52	74%	43	89%

### ***Post Disablement Mortality***

Old Mortality Basis: UP 94 Table:

New Mortality Basis: RP2000 Table

<b>Post-Disablement Mortality Assumptions</b>				
	<b>Old Assumptions</b>		<b>New Assumptions</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
<b>PERS</b>				
Age Offset	2	2	6	6
minimum	5.75%	3.25%	5.00%	3.50%
<b>TRS</b>				
Age Offset	-3	-1	5	2
minimum	2.50%	2.00%	3.00%	1.75%
<b>SERS</b>				
Age Offset	2	2	5	2
minimum	5.75%	3.25%	3.00%	3.00%
<b>LEOFF</b>				
Age Offset	2	2	2	2
minimum	0.50%	0.50%	0.50%	0.50%
<b>WSP</b>				
Age Offset	2	2	2	2
minimum	0.50%	0.50%	0.50%	0.50%

<b>PERS</b> <b>Mortality Experience</b> <b>Post-Disablement</b> 1995-2000					
Age	Actual	Old Assumptions		New Assumptions	
		Expected	Ratio	Expected	Ratio
-44	3	8	36%	8	37%
45-49	18	27	68%	25	72%
50-54	40	52	77%	48	83%
55-59	78	83	94%	77	101%
60-64	103	94	110%	88	117%
65-69	83	97	85%	91	91%
70-74	80	69	116%	72	112%
75-79	97	56	174%	84	116%
80-84	51	35	145%	56	92%
85-89	9	7	125%	11	80%
90-94	3	2	133%	3	97%
95-99	1	0	346%	0	279%
100+	0	0	0%	0	0%
Total	566	530	107%	565	100%

<b>TRS</b> <b>Mortality Experience</b> <b>Post-Disablement</b> 1995-2000					
Age	Actual	Old Assumptions		New Assumptions	
		Expected	Ratio	Expected	Ratio
-44	1	1	169%	1	159%
45-49	4	5	75%	5	74%
50-54	17	14	125%	14	122%
55-59	17	17	102%	17	98%
60-64	18	22	83%	23	79%
65-69	22	21	107%	22	99%
70-74	24	16	148%	26	94%
75-79	26	14	189%	24	109%
80-84	19	9	215%	14	135%
85-89	6	3	172%	5	115%
90-94	3	3	119%	3	90%
95-99	2	3	66%	3	62%
100+	1	1	112%	1	136%
Total	160	127	126%	158	101%

<p style="text-align: center;"><i>SERS</i>  <b>Mortality Experience</b>  <b>Post-Disablement</b>  1995-2000</p>					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-44	0	1	0%	1	0%
45-49	2	3	61%	2	97%
50-54	5	9	56%	6	80%
55-59	14	20	70%	16	89%
60-64	24	31	77%	23	106%
65-69	32	36	90%	26	125%
70-74	29	26	112%	23	129%
75-79	21	26	80%	31	69%
80-84	25	18	139%	21	120%
85-89	1	3	39%	3	31%
90-94	0	0	0%	0	0%
95-99	0	0	0%	0	0%
100+	0	0	0%	0	0%
<b>Total</b>	<b>153</b>	<b>172</b>	<b>89%</b>	<b>150</b>	<b>102%</b>

<p style="text-align: center;"><i>LEOFF</i>  <b>Mortality Experience</b>  <b>Post-Disablement</b>  1995-2000</p>					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-44	1	3	37%	3	37%
45-49	8	14	57%	14	57%
50-54	27	31	87%	31	88%
55-59	29	38	77%	30	96%
60-64	46	42	109%	34	133%
65-69	65	56	115%	48	134%
70-74	59	76	78%	71	84%
75-79	74	76	98%	73	101%
80-84	36	32	113%	33	110%
85-89	9	13	71%	14	64%
90-94	4	3	125%	3	116%
95-99	0	0	0%	0	0%
100+	0	0	0%	0	0%
<b>Total</b>	<b>358</b>	<b>384</b>	<b>93%</b>	<b>354</b>	<b>101%</b>

<i>WSP</i> <b>Mortality Experience</b> <b>Post-Disablement</b> 1995-2000					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-44	0	0	0%	0	0%
45-49	0	0	0%	0	0%
50-54	1	0	246%	0	250%
55-59	0	1	0%	0	0%
60-64	3	1	473%	1	581%
65-69	1	1	112%	1	131%
70-74	0	1	0%	1	0%
75-79	1	1	98%	1	102%
80-84	0	0	0%	0	0%
85-89	1	0	349%	0	315%
90-94	0	0	0%	0	0%
95-99	0	0	0%	0	0%
100+	0	0	0%	0	0%
Total	7	5	137%	5	149%

<b>Probability of Mortality RP2000*</b>		
<b>Age</b>	<b>Male Mortality</b>	<b>Female Mortality</b>
20	0.0345%	0.0191%
25	0.0376%	0.0207%
30	0.0444%	0.0264%
35	0.0773%	0.0475%
40	0.1079%	0.0706%
45	0.1508%	0.1124%
50	0.2138%	0.1676%
55	0.3624%	0.2717%
60	0.6747%	0.5055%
65	1.2737%	0.9706%
70	2.2206%	1.6742%
75	3.7834%	2.8106%
80	6.4368%	4.5879%
85	11.0757%	7.7446%
90	18.3408%	13.1682%
95	26.7491%	19.4509%

\*Combined Health table.

## Service Retirement/Probabilities of Retirement

### *Plan 1 – PERS, TRS, SERS, LEOFF and WSP*

**Old Basis:** Table based upon 1989-92 retirement experience.

**New Basis:** Table based upon 1995-00 retirement experience.

<i>PERS</i>					
Plan 1 Retirement Experience					
1995-2000					
Age	Actual	Old Assumptions		New Assumptions	
		Expected	Ratio	Expected	Ratio
-50	291	147	1.98	157	1.86
51	213	226	0.94	215	0.99
52	262	245	1.07	265	0.99
53	345	324	1.06	350	0.99
54	376	340	1.11	367	1.02
55	463	639	0.72	430	1.08
56	353	406	0.87	361	0.98
57	297	357	0.83	318	0.94
58	243	298	0.82	264	0.92
59	274	441	0.62	251	1.09
60	412	441	0.93	516	0.80
61	446	521	0.86	445	1.00
62	649	739	0.88	657	0.99
63	292	332	0.88	280	1.04
64	253	311	0.81	244	1.04
65	292	323	0.90	288	1.01
66	104	110	0.94	100	1.04
67	76	73	1.04	66	1.15
68	41	52	0.79	47	0.88
69	26	39	0.66	35	0.73
Total	5,708	6,364	0.90	5,656	1.01
70+	103				
	5,811				

<i>PERS</i>		
<b>Service Retirement</b>		
<b>Probability of Retirement</b>		
<b>Plan 1 Members Eligible to Retire</b>		
<b>Age</b>	<b>Male</b>	<b>Female</b>
50	64%	40%
51	57%	43%
52	52%	37%
53	52%	33%
54	52%	52%
55	22%	26%
56	22%	18%
57	22%	18%
58	22%	22%
59	22%	37%
60	22%	18%
61	22%	22%
62	40%	37%
63	26%	26%
64	30%	26%
65	49%	46%
66-69	30%	26%
70+	*	*

*\*Immediate retirement is assumed for every person who attains age 70.*



<i>TRS</i>					
<b>Plan 1 Retirement Experience</b>					
1995-2000					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
52	454	394	1.15	394	1.15
53	562	503	1.12	501	1.12
54	549	504	1.09	504	1.09
55	869	907	0.96	907	0.96
56	623	702	0.89	644	0.97
57	532	570	0.93	521	1.02
58	476	486	0.98	444	1.07
59	437	466	0.94	425	1.03
60	622	579	1.07	608	1.02
61	424	451	0.94	415	1.02
62	580	578	1.00	605	0.96
63	289	322	0.90	276	1.05
64	182	241	0.75	172	1.06
65	253	304	0.83	261	0.97
66	115	102	1.13	125	0.92
67	64	65	0.98	68	0.94
68	49	48	1.01	53	0.92
69	26	32	0.82	28	0.92
Total	7,106	7,253	0.98	6,949	1.02
70+	56				
	7,162				

<b>TRS</b> <b>Service Retirement</b> <b>Probability of Retirement</b> <b>Plan 1 Members Eligible to Retire</b>				
<b>Age</b>	<b>Service Not Equal to 30 Years</b>		<b>Service Equal to 30 Years</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
-53	25%	20%	40%	30%
54	25%	20%	40%	30%
55	25%	20%	40%	30%
56	20%	20%	35%	30%
57	20%	20%	35%	30%
58	20%	20%	40%	30%
59	20%	25%	45%	30%
60	20%	25%	45%	30%
61	20%	20%	60%	35%
62	45%	35%	60%	55%
63	30%	25%	60%	50%
64	25%	20%	60%	50%
65	45%	45%	90%	90%
66	45%	35%	90%	90%
67	35%	30%	90%	90%
68	30%	35%	90%	90%
69	30%	25%	90%	90%
70+	*	*	*	*

*\*Immediate retirement is assumed for every person who attains age 70.*

<i>LEOFF</i>					
<b>Plan 1 Retirement Experience</b>					
1995-2000					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
50	128	196	0.65	126	1.01
51	82	58	1.41	82	1.00
52	81	102	0.79	81	1.00
53	67	129	0.52	67	1.00
54	61	94	0.65	61	1.00
55	81	71	1.14	76	1.07
56	42	32	1.32	54	0.78
57	45	23	1.99	38	1.17
58	37	15	2.49	39	0.96
59	17	22	0.76	26	0.64
60	29	15	1.91	18	1.62
61	17	24	0.70	16	1.06
62	9	15	0.61	10	0.93
63	5	5	1.08	5	0.95
64	5	3	1.64	5	0.95
Total	706	804	0.88	704	1.00
65+	6				
	712				

<i>LEOFF</i>	
<b>Service Retirement Probability of Retirement Plan 1 Members Eligible to Retire</b>	
<b>Age</b>	<b>Probability of Retirement</b>
50	9%
51	7%
52	8%
53	8%
54	10%
55	16%
56	16%
57	16%
58	23%
59	23%
60	23%
61	28%
62	28%
63	28%
64	40%
65+	*

*\*Immediate retirement is assumed for every person who attains age 65.*

<i>WSP</i>					
<b>Retirement Experience</b>					
1995-2000					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
45	8	5	1.62	3	2.33
46	9	15	0.59	11	0.85
47	15	27	0.55	19	0.79
48	27	38	0.71	26	1.03
49	24	37	0.65	26	0.94
50	28	38	0.75	26	1.07
51	17	36	0.48	20	0.84
52	17	34	0.49	20	0.87
53	20	30	0.66	17	1.16
54	15	23	0.66	13	1.16
55	13	21	0.61	12	1.08
56	7	15	0.48	11	0.61
57	10	9	1.06	7	1.34
58	3	5	0.61	4	0.78
59	5	3	1.79	2	2.26
Total	218	336	0.65	218	1.00
60+	2				

<i>WSP</i>	
<b>Service Retirement</b>	
<b>Probability of Retirement</b>	
<b>Members Eligible to Retire</b>	
<b>Age</b>	<b>Probability of Retirement</b>
up to 50	31%
51-55	23%
56-59	28%
60	*

\* Immediate retirement is assumed for every person who attains age 60.

## Service Retirement/Probabilities of Retirement

### *Plan 2/3 – PERS, TRS, SERS, LEOFF and WSP*

<i>PERS</i>					
Plan 2/3 Retirement Experience					
1995-2000					
Age	Actual	Old Assumptions		New Assumptions	
		Expected	Ratio	Expected	Ratio
55	17	13	1.27	19	0.89
56	19	12	1.55	17	1.09
57	20	16	1.28	17	1.19
58	27	15	1.79	22	1.22
59	23	15	1.55	20	1.16
60	36	19	1.94	36	0.99
61	37	19	1.96	38	0.98
62	76	132	0.58	78	0.98
63	54	56	0.96	52	1.03
64	413	206	2.00	416	0.99
65	941	1,210	0.78	955	0.99
66	274	418	0.66	278	0.99
67	162	291	0.56	157	1.03
68	112	214	0.52	115	0.97
69	90	159	0.57	86	1.05
Total	2,301	2,796	0.82	2,305	1.00
70+	262				
	2,563				

<p style="text-align: center;"><i>PERS</i></p> <p style="text-align: center;"><b>Service Retirement</b></p> <p style="text-align: center;"><b>Probability of Retirement</b></p> <p style="text-align: center;"><b>Plan 2/3 Members Eligible to Retire</b></p>				
<b>Age</b>	<b>Service less than 30 Years</b>		<b>Service greater than or Equal to 30 Years</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
55	5%	5%	7%	7%
56	5%	5%	7%	7%
57	5%	5%	7%	7%
58	10%	5%	14%	7%
59	10%	5%	14%	7%
60	14%	14%	21%	21%
61	14%	18%	21%	27%
62	33%	30%	50%	45%
63	26%	26%	39%	39%
64	79%	82%	90%	90%
65	52%	49%	52%	49%
66	30%	30%	30%	30%
67	22%	26%	22%	26%
68	22%	26%	22%	26%
69	26%	22%	26%	22%
70+	*	*	*	*

*\*Immediate retirement is assumed for every person who attains age 70.*

<i>TRS</i>					
<b>Plan 2/3 Retirement Experience</b>					
1995-2000					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
55	22	26	0.86	21	1.05
56	33	21	1.59	24	1.36
57	25	19	1.34	31	0.81
58	22	15	1.45	25	0.87
59	22	14	1.57	18	1.21
60	21	13	1.57	24	0.87
61	22	9	2.38	24	0.90
62	21	39	0.54	21	0.99
63	17	16	1.07	18	0.96
64	36	26	1.38	35	1.04
65	94	135	0.70	98	0.96
66	34	40	0.85	33	1.05
67	14	21	0.67	15	0.97
68	10	16	0.64	11	0.93
69	12	11	1.09	11	1.09
Total	405	420	0.96	408	0.99
70+	18				
	423				



<i>TRS</i> <b>Service Retirement</b> <b>Probability of Retirement</b> <b>Plan 2/3 Members Eligible to Retire</b>				
<b>Age</b>	<b>Service less than 30 Years</b>		<b>Service greater than or Equal to 30 Years</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
55	5%	3%	8%	5%
56	5%	5%	8%	8%
57	5%	10%	8%	15%
58	5%	10%	8%	15%
59	5%	10%	8%	15%
60	20%	15%	30%	23%
61	40%	20%	60%	30%
62	30%	30%	45%	45%
63	30%	30%	45%	45%
64	60%	50%	90%	75%
65	50%	50%	50%	50%
66	50%	30%	50%	30%
67	50%	25%	50%	25%
68	50%	25%	50%	25%
69	50%	40%	50%	40%
70+	*	*	*	*

\*Immediate retirement is assumed for every person who attains age 70.

Approximately 50% of those eligible to retire in plan 3 elect to defer their benefit.

<i>SERS</i>					
<b>Plan 2/3 Retirement Experience</b>					
1995-2000					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
55	12	16	0.77	17	0.71
56	9	17	0.54	18	0.50
57	8	16	0.51	14	0.58
58	15	12	1.23	13	1.15
59	14	15	0.96	13	1.08
60	19	14	1.40	22	0.85
61	16	12	1.29	24	0.67
62	23	55	0.42	30	0.76
63	13	22	0.59	21	0.63
64	163	81	2.01	164	0.99
65	358	479	0.75	376	0.95
66	103	161	0.64	109	0.94
67	57	120	0.47	66	0.86
68	49	97	0.50	53	0.92
69	50	78	0.64	42	1.19
Total	909	1,194	0.76	983	0.92
70+	108				
	1,017				

<b>SERS</b> <b>Service Retirement</b> <b>Probability of Retirement</b> <b>Plan 2/3 Members Eligible to Retire</b>				
<b>Age</b>	<b>Service less than 30 Years</b>		<b>Service greater than or Equal to 30 Years</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
55	5%	5%	7%	7%
56	5%	5%	7%	7%
57	5%	5%	7%	7%
58	10%	5%	14%	7%
59	10%	5%	14%	7%
60	14%	14%	21%	21%
61	14%	18%	21%	27%
62	33%	30%	50%	45%
63	26%	26%	39%	39%
64	79%	82%	90%	90%
65	52%	49%	52%	49%
66	30%	30%	30%	30%
67	22%	26%	22%	26%
68	22%	26%	22%	26%
69	26%	22%	26%	22%
70+	*	*	*	*

*\*Immediate retirement is assumed for every person who attains age 70.*

Approximately 50% of those eligible to retire in plan 3 elect to defer their benefit.

<i>LEOFF</i>					
<b>Plan 2 Retirement Experience</b>					
1995-2000					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
50	5	7	0.73	10	0.48
51	1	7	0.15	8	0.13
52	4	7	0.56	6	0.69
53	11	226	0.05	49	0.23
54	13	109	0.12	39	0.34
55	9	92	0.10	41	0.22
56	10	51	0.20	37	0.27
57	8	38	0.21	28	0.29
58	10	50	0.20	29	0.34
59	12	38	0.31	22	0.54
60	10	26	0.38	15	0.66
61	3	21	0.14	14	0.21
62	8	16	0.49	11	0.71
63	2	11	0.19	7	0.27
64	2	9	0.23	8	0.24
65	8	29	0.28	29	0.28
Total	116	738	0.16	354	0.33

These rates reflect the lowered Normal Retirement Age at 53

<b>LEOFF</b> <b>Service Retirement</b> <b>Probability of Retirement</b> <b>Plan 2 Members</b> <b>Eligible to Retire</b>	
<b>Age</b>	<b>Probability of Retirement</b>
50	10%
51	10%
52	10%
53	16%
54	19%
55	24%
56	25%
57	25%
58	33%
59	33%
60	33%
61	37%
62	37%
63	37%
64	48%
65+	*

These rates reflect the lowered Normal Retirement Age at 53

*\*Immediate retirement is assumed for every person who attains age 65.*

## Disability

The number of disabilities in any retirement plan is largely determined by the size of the benefit and the difficulty in satisfying the requirements for being disabled. Disability is a relatively minor decrement in all of PERS, TRS, SERS and in LEOFF 2 and WSP. In LEOFF 1 it is the primary decrement.

The rate of disability represents the rate that active members begin the disability benefit. It does not represent the number of members that become disabled and cannot continue to work in their current job. Some members who cannot continue will change to other jobs, take a regular retirement if eligible, quit and withdraw their contributions, or quit and receive a benefit at regular retirement age. Only those disabilities that initiate a disability are included.

**Old Basis:** Disability Table based on 1989-94 experience.

**New Basis:** Disability Table based on 1995-00 experience.

<i>PERS</i>					
<b>Disability Experience</b>					
1995-2000					
<b>Plan 1</b>		<b>Old Assumptions</b>		<b>New Assumptions</b>	
<b>Age</b>	<b>Actual</b>	<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-39	0	1	0.00	1	0.00
40-44	27	24	1.11	27	0.99
45-49	89	101	0.88	99	0.90
50-54	186	177	1.05	207	0.90
55-59	237	146	1.62	213	1.11
60	4	1	2.93	7	0.57
Total	543	451	1.20	555	0.98

  

<b>Plan 2</b>		<b>Old Assumptions</b>		<b>New Assumptions</b>	
<b>Age</b>	<b>Actual</b>	<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-39	35	1	29.45	36	0.98
40-44	35	9	3.83	39	0.90
45-49	65	38	1.72	68	0.96
50-54	90	86	1.05	102	0.88
55-59	148	121	1.22	159	0.93
60	209	167	1.25	194	1.08
Total	582	422	1.38	597	0.97

*None assumed after age 70*

<i>PERS</i>				
<b>Probability of Disablement</b>				
<i>(for those not eligible to retire)</i>				
<b>Age</b>	<b>Plan 1</b>		<b>Plan 2</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
20	0.0000%	0.0000%	0.0000%	0.0000%
25	0.0000%	0.0000%	0.0052%	0.0000%
30	0.0000%	0.0000%	0.0115%	0.0056%
35	0.0310%	0.0319%	0.0156%	0.0194%
40	0.0762%	0.0710%	0.0235%	0.0275%
45	0.1481%	0.1431%	0.0476%	0.0467%
50	0.2542%	0.3023%	0.0922%	0.1003%
55	0.8240%	0.6411%	0.2630%	0.2782%
60	1.1701%	0.6502%	0.7603%	0.7681%
64	1.1701%	0.5495%	1.0244%	1.0271%

<i>TRS</i> <b>Disability Experience</b> 1995-2000					
<b>Plan 1</b>		<b>Old Assumptions</b>		<b>New Assumptions</b>	
<b>Age</b>	<b>Actual</b>	<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-34	0	0	n/a	0	n/a
35-39	0	0	0.00	0	0.00
40-44	10	6	1.73	8	1.28
45-49	44	38	1.17	51	0.87
50-54	98	67	1.45	91	1.08
55-59	36	29	1.26	39	0.93
60	1	0	2.93	0	2.17
Total	189	140	1.35	189	1.00

  

<b>Plan 2/3</b>		<b>Old Assumptions</b>		<b>New Assumptions</b>	
<b>Age</b>	<b>Actual</b>	<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-34	0	9	0.00	3	0.00
35-39	3	11	0.28	3	0.91
40-44	1	20	0.05	6	0.16
45-49	5	35	0.14	11	0.48
50-54	9	36	0.25	11	0.82
55-59	12	20	0.60	6	1.98
60	13	10	1.26	3	4.15
Total	43	142	0.30	43	1.00

*None assumed after age 70*

<i>TRS</i> <b>Probability of Disablement</b> <i>(for those not eligible to retire)</i>				
<b>Age</b>	<b>Plan 1</b>		<b>Plan 2/3</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
20	0.0013%	0.0014%	0.0003%	0.0003%
25	0.0091%	0.0092%	0.0024%	0.0019%
30	0.0187%	0.0190%	0.0048%	0.0040%
35	0.0321%	0.0326%	0.0083%	0.0068%
40	0.0428%	0.0434%	0.0111%	0.0091%
45	0.0944%	0.0957%	0.0244%	0.0201%
50	0.1634%	0.1656%	0.0422%	0.0347%
55	0.3347%	0.3393%	0.0866%	0.0712%
60	0.4686%	0.4750%	0.1212%	0.0997%
64	0.7213%	0.7311%	0.1865%	0.1534%

SERS					
Disability Experience					
1995-2000					
Plan 2/3		Old Assumptions		New Assumptions	
Age	Actual	Expected	Ratio	Expected	Ratio
-39	9	0	29.35	9	1.06
40-44	8	3	2.56	10	0.83
45-49	17	15	1.14	20	0.84
50-54	39	36	1.08	46	0.85
55-59	74	49	1.50	73	1.02
60	82	72	1.14	76	1.08
Total	229	176	1.30	233	0.98

*None assumed after age 70*

SERS		
Probability of Disablement		
(for those not eligible to retire)		
Age	Plan 2/3	
	Male	Female
20	0.0000%	0.0000%
25	0.0000%	0.0000%
30	0.0000%	0.0048%
35	0.0081%	0.0176%
40	0.0258%	0.0164%
45	0.0568%	0.0201%
50	0.1102%	0.0738%
55	0.3428%	0.2876%
60	0.9292%	0.5589%
64	1.2272%	0.6589%



<i>LEOFF</i>					
<b>Disability Experience</b>					
1995-2000					
<b>Plan 1</b>		<b>Old Assumptions</b>		<b>New Assumptions</b>	
<b>Age</b>	<b>Actual</b>	<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-34	0	0	n/a	0	n/a
35-39	2	2	1.07	2	0.99
40-44	64	51	1.25	55	1.16
45-49	283	306	0.92	331	0.86
50-54	481	394	1.22	425	1.13
55-59	140	136	1.03	146	0.96
60	14	23	0.61	25	0.57
Total	984	912	1.08	984	1.00

  

<b>Plan 2</b>		<b>Old Assumptions</b>		<b>New Assumptions</b>	
<b>Age</b>	<b>Actual</b>	<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
-34	1	4	0.25	1	1.13
35-39	1	4	0.24	1	1.09
40-44	1	7	0.15	1	0.70
45-49	1	8	0.13	2	0.59
50-54	2	4	0.47	1	2.13
55-59	0	0	n/a	0	n/a
60	0	0	n/a	0	n/a
Total	6	27	0.22	6	1.00

<i>LEOFF</i>		
<b>Probability of Disablement</b>		
<b>Age</b>	<b>Plan 1</b>	<b>Plan 2</b>
20	0.10%	0.00%
25	0.10%	0.00%
30	0.80%	0.00%
35	1.48%	0.00%
40	2.35%	0.01%
45	4.24%	0.02%
50	7.34%	0.05%
55	10.35%	0.10%
60+	12.17%	0.10%

WSP disability benefits are not provided by the retirement system. They are provided through the WSP operating budget. However, when the disabled member dies the retirement system does provide a survivor benefit if there is an eligible spouse.

Initially, the disability status is quite similar to that of termination of employment. In both cases an actively employed member ceases to earn compensation and make contributions to the retirement fund yet does not receive a monthly benefit from the retirement system. However, at age 60 the terminated vested member will begin drawing a pension from the trust fund whereas the disabled member will continue to receive payments from the operating fund for life.

<i>WSP</i>		
<b>Probability of Disablement</b>		
<b>Year</b>	<b>Disabilities</b>	<b>Active Members</b>
2000	0	968
1999	1	929
1998	1	927
1997	2	918
1996	2	901
Total	6	4,643
Probability of Disablement		0.1%

## Terminations

At least two successive years of experience are needed to determine the status of a terminating member with any degree of confidence due to the significant number of members who return to work following a short absence.

**Old Basis:** Termination tables based on the 1989-93 experience.

**New Basis:** Termination tables based on the 1995-98 experience.

<i>PERS</i>					
<b>Termination Experience</b>					
1995-1998					
<b>Years of Service</b>	<b>Old Assumptions</b>			<b>New Assumptions</b>	
	<b>Actual</b>	<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
0-1	14,338	11,569	1.24	14,334	1.00
2-3	6,854	6,175	1.11	6,857	1.00
4-5	4,478	3,816	1.17	4,481	1.00
6-7	3,106	2,737	1.14	3,111	1.00
8-9	1,879	1,893	0.99	1,917	0.98
10-11	1,364	1,352	1.01	1,351	1.01
12-13	992	894	1.11	1,003	0.99
14-15	779	542	1.44	753	1.04
16-17	592	358	1.65	583	1.02
18-19	359	237	1.52	386	0.93
20-21	187	133	1.40	198	0.94
22-23	92	67	1.38	107	0.86
24-25	41	31	1.31	50	0.82
26-27	22	17	1.28	22	0.98
28-29	6	9	0.66	10	0.59
Total	35,089	29,831	1.18	35,081	1.00

<i>PERS</i>		
<b>General Employment Turnover</b>		
<b>Probability of Termination in the Next Year</b>		
<b>Years of Service</b>	<b>Male</b>	<b>Female</b>
0	25.90%	26.39%
1	15.46%	16.72%
2	10.20%	11.72%
3	7.69%	9.25%
4	6.39%	7.69%
5	5.31%	6.53%
6	4.35%	5.87%
7	4.07%	5.31%
8	3.73%	4.69%
9	3.54%	4.11%
10	3.25%	3.87%
11	3.10%	3.54%
12	3.05%	3.15%
13	2.86%	3.10%
14	2.76%	3.00%
15	2.66%	2.86%
16	2.37%	2.62%
17	2.13%	2.27%
18	1.83%	1.98%
19	1.49%	1.73%
20	1.14%	1.44%
21	0.95%	1.14%
22	0.75%	0.95%
23	0.60%	0.80%
24	0.55%	0.55%
25	0.50%	0.45%
26+	0.40%	0.40%

<i>TRS</i>					
<b>Termination Experience</b>					
1995-1998					
<b>Age</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
0-1	1,723	1,242	1.39	1,723	1.00
2-3	1,682	1,612	1.04	1,694	0.99
4-5	1,097	1,196	0.92	1,114	0.98
6-7	682	772	0.88	677	1.01
8-9	392	458	0.86	389	1.01
10-11	289	298	0.97	279	1.04
12-13	183	186	0.98	182	1.00
14-15	133	138	0.97	144	0.93
16-17	137	123	1.11	140	0.98
18-19	99	101	0.98	103	0.96
20-21	86	83	1.03	75	1.14
22-23	49	74	0.67	56	0.87
24-25	61	62	0.99	50	1.23
26-27	48	48	1.00	39	1.22
28-29	<u>24</u>	<u>32</u>	<u>0.74</u>	<u>26</u>	<u>0.91</u>
Total	<u>6,685</u>	<u>6,425</u>	<u>1.04</u>	<u>6,692</u>	<u>1.00</u>

<i>TRS</i>		
<b>General Employment Turnover</b>		
<b>Probability of Termination in the Next Year</b>		
<b>Years of Service</b>	<b>Male</b>	<b>Female</b>
0	9.65%	10.00%
1	9.65%	10.00%
2	6.00%	7.00%
3	4.00%	5.50%
4	4.00%	4.50%
5	3.50%	4.00%
6	3.00%	3.50%
7	2.20%	3.00%
8	2.10%	2.60%
9	2.00%	2.00%
10	1.90%	1.95%
11	1.80%	1.90%
12	1.80%	1.70%
13	1.00%	1.40%
14	1.00%	1.40%
15	1.00%	1.40%
16	1.00%	1.40%
17	0.95%	1.10%
18	0.90%	0.90%
19	0.80%	0.90%
20	0.70%	0.90%
21+	0.50%	0.50%

<i>SERS</i>					
<b>Termination Experience</b>					
1995-1998					
<b>Years of Service</b>	<b>Old Assumptions</b>			<b>New Assumptions</b>	
	<b>Actual</b>	<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
0-1	6,286	6,054	1.04	6,285	1.00
2-3	2,945	2,950	1.00	2,948	1.00
4-5	1,815	1,717	1.06	1,878	0.97
6-7	1,132	1,004	1.13	1,173	0.97
8-9	693	640	1.08	715	0.97
10-11	523	420	1.24	510	1.03
12-13	364	255	1.43	375	0.97
14-15	260	140	1.85	261	1.00
16-17	198	92	2.16	187	1.06
18-19	104	59	1.75	122	0.85
20-21	56	32	1.77	56	0.99
22-23	17	14	1.21	25	0.69
24-25	9	5	1.84	9	1.02
26-27	3	2	2.00	3	1.04
28-29	1	1	1.43	1	0.91
Total	14,406	13,385	1.08	14,535	0.99

<i>SERS</i>		
<b>General Employment Turnover</b>		
<b>Probability of Termination in the Next Year</b>		
<b>Years of Service</b>	<b>Male</b>	<b>Female</b>
0	25.90%	19.45%
1	16.09%	12.87%
2	11.54%	10.07%
3	10.07%	7.60%
4	8.52%	6.58%
5	7.28%	5.97%
6	6.06%	5.31%
7	5.59%	5.21%
8	4.93%	4.83%
9	4.64%	4.64%
10	4.26%	4.50%
11	4.02%	4.45%
12	3.83%	4.40%
13	3.73%	4.40%
14	3.25%	4.21%
15	2.96%	4.26%
16	2.66%	3.78%
17	2.42%	3.44%
18	2.03%	3.10%
19	1.59%	2.62%
20	1.24%	2.03%
21	1.14%	1.59%
22	0.85%	1.29%
23	0.65%	0.85%
24	0.65%	0.75%
25	0.50%	0.75%
26+	0.50%	0.75%



<i>LEOFF</i>					
<b>Termination Experience</b>					
1995-1998					
<b>Years of Service</b>	<b>Actual</b>	<b>Old Assumptions</b>		<b>New Assumptions</b>	
		<b>Expected</b>	<b>Ratio</b>	<b>Expected</b>	<b>Ratio</b>
0-1	303	311	0.97	305	0.99
2-3	131	140	0.94	131	1.00
4-5	106	113	0.94	114	0.93
6-7	116	96	1.21	107	1.08
8-9	71	67	1.06	72	0.98
10-11	56	49	1.14	57	0.99
12-13	45	26	1.74	43	1.04
14-15	36	13	2.80	32	1.11
16-17	24	11	2.25	30	0.80
18-19	21	8	2.69	18	1.15
20-21	15	5	2.79	13	1.19
22-23	6	5	1.25	11	0.54
24-25	8	3	2.29	8	0.98
26-27	3	2	1.95	4	0.84
28-29	3	0	18.52	0	9.12
Total	944	847	1.11	934	1.01

<b><i>LEOFF</i></b> <b>General Employment</b> <b>Turnover</b> <b>Probability of Termination in</b> <b>the Next Year</b>	
<b>Years of Service</b>	<b>Male and Female</b>
0	10.43%
1	4.69%
2	2.37%
3	2.08%
4	1.98%
5	1.94%
6	1.94%
7	1.94%
8	1.67%
9	1.67%
10	1.67%
11	1.42%
12	1.42%
13	1.42%
14	0.99%
15	0.99%
16	0.99%
17	0.70%
18	0.70%
19	0.70%
20	0.70%
21	0.70%
22	0.70%
23	0.70%
24	0.70%
25	0.70%
26	0.70%
27	0.70%
28	0.70%
29+	0.00%

<i>WSP</i>							
<b>Termination Experience</b>							
1995-1998							
<u>Old Assumptions</u>				<b>Years of Service</b>	<u>New Assumptions</u>		
<b>Age</b>	<b>Actual</b>	<b>Expected</b>	<b>Ratio</b>		<b>Actual</b>	<b>Expected</b>	<b>Ratio</b>
20-24	1	1	1.43	0-4	13	13	1.00
25-29	16	9	1.87	5-9	15	15	1.00
30-34	8	10	0.77	10-14	5	5	1.00
35-39	8	6	1.34	15-19	3	3	1.00
40-44	1	5	0.21	20-24	1	1	1.00
45-49	2	4	0.56	25-29	0	0	n/a
50-54	1	1	1.25	30-34	0	0	n/a
Total	37	35	1.07	Total	37	37	1.00

<i>WSP</i>			
<b>General Employment Turnover</b>			
<b>Probability of Termination and Disability in the Next Year</b>			
<b>Years of Service</b>	<b>Termination Rate</b>	<b>Disability Rate</b>	<b>Total</b>
0-4	2.4%	0.1%	2.5%
5-9	1.4%	0.1%	1.5%
10-14	0.9%	0.1%	1.0%
15-19	0.6%	0.1%	0.7%
20-25	0.2%	0.1%	0.3%
25+	0.0%	0.1%	0.1%

## Termination with Vested Benefit

A plan 1 or 2 member who terminates may have a choice as to what to do with their retirement benefit. They may withdraw their own accumulated contributions and destroy their service credit. They will not receive a service retirement benefit at a later date. Those that are vested may decide to leave their contributions and receive a retirement upon reaching retirement age. The following tables demonstrate the probability that a vested member who terminates employment will leave their accumulated contributions. We refer to this as the *Probability of Vesting Upon Termination*.

**Old Basis:** Probability of Vesting Upon Termination Table based on 1985-88 experience.

**New Basis:** Probability of Vesting Upon Termination Table based on 1995-98 experience.

<i>PERS</i>		
<b>Probability of Vesting Upon Termination</b>		
<i>(for those not eligible to early retire)</i>		
<b>Years of Service</b>	<b>Plan 1</b>	<b>Plan 2/3</b>
<5	0%	0%
5	35%	35%
6	45%	35%
7	45%	40%
8	45%	40%
9	45%	45%
10	45%	45%
11	45%	45%
12	45%	45%
13	45%	45%
14	55%	45%
15	55%	50%
16	60%	50%
17	60%	55%
18	60%	55%
19	60%	60%
20	60%	60%
21	60%	60%
22	60%	60%
23	60%	60%
24	60%	60%
25	65%	65%
26	65%	65%
27	75%	75%
28	75%	75%
29	75%	75%
30+	100%	100%

<i>TRS</i>		
<b>Probability of Vesting Upon Termination</b>		
<i>(for those not eligible to early retire)</i>		
<b>Years of Service</b>	<b>Plan 1</b>	<b>Plan 2/3</b>
<5	0%	0%
5	65%	60%
6	65%	60%
7	75%	60%
8	75%	60%
9	75%	65%
10	75%	65%
11	75%	65%
12	75%	65%
13	75%	70%
14	85%	70%
15	85%	70%
16	85%	70%
17	85%	80%
18	85%	80%
19	85%	85%
20	85%	85%
21	90%	90%
22	90%	90%
23	90%	90%
24	90%	90%
25	90%	90%
26	90%	90%
27	95%	95%
28	100%	100%
29+	100%	100%

<i>SERS</i>	
<b>Probability of Vesting Upon Termination</b>	
<i>(for those not eligible to early retire)</i>	
<b>Years of Service</b>	<b>Plan 2/3</b>
<5	0%
5	50%
6	50%
7	55%
8	55%
9	55%
10	60%
11	60%
12	60%
13	60%
14	65%
15	65%
16	70%
17	70%
18	70%
19	70%
20	70%
21	75%
22	80%
23	80%
24	80%
25	80%
26	80%
27+	100%

<i>LEOFF</i>	
<b>Probability of Vesting Upon Termination</b>	
<i>(for those not eligible to early retire)</i>	
<b>Years of Service</b>	<b>Plan 2/3</b>
<5	0%
5	15%
6	15%
7	15%
8	15%
9	15%
10	15%
11	15%
12	15%
13	15%
14	15%
15	15%
16	15%
17	15%
18	35%
19	35%
20	75%
21+	100%

<i>WSP</i>	
<b>Probability of Vesting Upon Termination</b>	
<b>Years of Service</b>	<b>Percent Vested</b>
<5	0%
5	15%
6	15%
7	15%
8	15%
9	15%
10	15%
11	15%
12	15%
13	15%
14	15%
15	15%
16	15%
17	15%
18	35%
19	35%
20	75%
21+	100%

## Portability

Portability increases the liabilities associated with dual members. The increased costs are a function of their salary and service in their later system. The 1995-2000 Experience Study determined the future retirement benefits of each system should be increased to account for increased benefits due to the portability statutes.

Portability		
System	Plan	Load
PERS	1	0.2%
	2	0.3%
TRS	1	0.3%
	2	0.1%
	3	0.1%
SERS	1	0.3%
	2	0.3%
LEOFF	1	N/A
	2	0.1%
WSP	1	0.0%

## Salary Increase

Salary increases usually have two parts: (1) a cost-of-living or inflation component, and (2) a step/longevity increase. This experience study will focus on the step portion of pay increases. The cost-of-living component is one of the economic assumptions adopted separately.

## Step/longevity Salary Increase

**Old Basis:** Scale based on the 1989-94 Experience.

**New Basis:** Scale based on the 1995-00 Experience.

<i>PERS</i>				
Step Salary Increase Assumptions				
Years of Service	New % Increase	Remaining Step Increase	Old % Increase	Remaining Step Increase
1	6.1%	1.275	3.8%	1.183
2	4.8%	1.201	3.0%	1.140
3	3.8%	1.146	2.5%	1.107
4	2.9%	1.104	1.9%	1.080
5	2.1%	1.073	1.4%	1.059
6	1.3%	1.051	1.0%	1.045
7	1.0%	1.038	0.7%	1.035
8	0.8%	1.027	0.5%	1.027
9	0.6%	1.019	0.5%	1.022
10	0.4%	1.013	0.4%	1.017
11	0.3%	1.009	0.4%	1.013
12	0.2%	1.006	0.3%	1.009
13	0.1%	1.004	0.2%	1.006
14	0.1%	1.003	0.2%	1.004
15	0.1%	1.002	0.2%	1.002
16	0.1%	1.001	0.0%	1.000
17	0.0%	1.000	0.0%	1.000
18	0.0%	1.000	0.0%	1.000
19	0.0%	1.000	0.0%	1.000
20	0.0%	1.000	0.0%	1.000
21+	0.0%	1.000	0.0%	1.000



<i>TRS</i>				
<b>Step Salary Increase Assumptions</b>				
<b>Years of Service</b>	<b>New % Increase</b>	<b>Remaining Step Increase</b>	<b>Old % Increase</b>	<b>Remaining Step Increase</b>
1	6.2%	1.476	4.5%	1.607
2	4.4%	1.390	4.2%	1.538
3	4.2%	1.331	3.8%	1.476
4	3.5%	1.278	3.6%	1.422
5	3.1%	1.235	3.5%	1.373
6	2.7%	1.197	3.3%	1.326
7	2.6%	1.166	3.2%	1.284
8	2.3%	1.136	3.1%	1.244
9	2.1%	1.111	3.0%	1.207
10	1.9%	1.088	3.0%	1.171
11	1.7%	1.068	3.0%	1.137
12	1.6%	1.050	3.0%	1.104
13	1.4%	1.033	2.5%	1.072
14	0.9%	1.019	1.5%	1.046
15	0.8%	1.010	0.5%	1.030
16	0.2%	1.002	0.5%	1.025
17	0.0%	1.000	0.5%	1.020
18	0.0%	1.000	0.5%	1.015
19	0.0%	1.000	0.5%	1.010
20	0.0%	1.000	0.5%	1.005
21+	0.0%	1.000	0.5%	1.000

<i>SERS</i>				
<b>Step Salary Increase Assumptions</b>				
<b>Years of Service</b>	<b>New % Increase</b>	<b>Remaining Step Increase</b>	<b>Old % Increase</b>	<b>Remaining Step Increase</b>
1	7.0%	1.280	3.8%	1.183
2	3.9%	1.196	3.0%	1.140
3	2.8%	1.151	2.5%	1.107
4	2.3%	1.120	1.9%	1.080
5	2.2%	1.095	1.4%	1.059
6	1.5%	1.071	1.0%	1.045
7	1.2%	1.055	0.7%	1.035
8	1.0%	1.043	0.5%	1.027
9	0.8%	1.032	0.5%	1.022
10	0.7%	1.024	0.4%	1.017
11	0.7%	1.017	0.4%	1.013
12	0.3%	1.010	0.3%	1.009
13	0.3%	1.007	0.2%	1.006
14	0.2%	1.004	0.2%	1.004
15	0.1%	1.002	0.2%	1.002
16	0.1%	1.001	0.0%	1.000
17	0.0%	1.000	0.0%	1.000
18	0.0%	1.000	0.0%	1.000
19	0.0%	1.000	0.0%	1.000
20	0.0%	1.000	0.0%	1.000
21+	0.0%	1.000	0.0%	1.000

<i>LEOFF</i>				
<b>Step Salary Increase Assumptions</b>				
<b>Years of Service</b>	<b>New % Increase</b>	<b>Remaining Step Increase</b>	<b>Old % Increase</b>	<b>Remaining Step Increase</b>
1	11.7%	1.810	7.0%	1.397
2	8.1%	1.621	5.0%	1.306
3	6.6%	1.499	4.0%	1.244
4	4.5%	1.406	2.5%	1.196
5	3.2%	1.346	2.0%	1.167
6	2.5%	1.304	1.5%	1.144
7	2.2%	1.272	1.4%	1.127
8	2.0%	1.245	1.3%	1.111
9	2.0%	1.221	1.2%	1.097
10	2.0%	1.197	1.1%	1.084
11	1.9%	1.173	1.0%	1.072
12	1.8%	1.151	1.0%	1.062
13	1.7%	1.131	0.9%	1.051
14	1.6%	1.112	0.8%	1.042
15	1.6%	1.095	0.7%	1.033
16	1.6%	1.077	0.6%	1.026
17	1.6%	1.060	0.5%	1.020
18	1.6%	1.044	0.5%	1.015
19	1.4%	1.027	0.5%	1.010
20	1.3%	1.013	0.5%	1.005
21+	0.0%	1.000	0.5%	1.000

<i>WSP</i>				
<b>Step Salary Increase Assumptions</b>				
<b>Years of Service</b>	<b>New % Increase</b>	<b>Remaining Step Increase</b>	<b>Old % Increase</b>	<b>Remaining Step Increase</b>
1	6.0%	1.678	6.0%	1.258
2	6.0%	1.583	5.0%	1.187
3	6.0%	1.493	5.0%	1.130
4	6.0%	1.409	4.5%	1.076
5	6.0%	1.329	3.0%	1.030
6	6.0%	1.254	0.0%	1.000
7	1.3%	1.183	0.0%	1.000
8	1.3%	1.168	0.0%	1.000
9	1.3%	1.153	0.0%	1.000
10	1.3%	1.138	0.0%	1.000
11	1.3%	1.123	0.0%	1.000
12	1.3%	1.109	0.0%	1.000
13	1.3%	1.095	0.0%	1.000
14	1.3%	1.081	0.0%	1.000
15	1.3%	1.067	0.0%	1.000
16	1.3%	1.053	0.0%	1.000
17	1.3%	1.040	0.0%	1.000
18	1.3%	1.026	0.0%	1.000
19	1.3%	1.013	0.0%	1.000
20	0.0%	1.000	0.0%	1.000
21+	0.0%	1.000	0.0%	1.000

## Development of Average Final Compensation (AFC)

PERS, TRS and WSP Plans 1 benefit is a function of the highest two consecutive years salary or Average Final Compensation(AFC). Included in the salary used to compute the AFC may be some items of pay that are not part of regular salary. These include cashout of unused sick and annual leave, etc. There is a great incentive for members to boost their AFC through working additional overtime since they will reap the rewards for a lifetime.

The cost associated with some increases to the AFC is billed back to the employer as an “excess compensation” billing according to RCW 41.50.150. The current study indicates the net increases in projected AFC should be as follows:

	<u>Old</u>	<u>New</u>
<b>PERS 1</b>	6.0%	5.0%
<b>TRS 1</b>	2.0%	1.0%
<b>WSP</b>	8.0%	7.5%

The Plans 2/3 have a 60 month AFC that includes overtime but does not include any cashout of sick or annual leave. This removes the need to load the projected AFC. LEOFF 1 benefits are based on base salary without overtime or cashout of leave.

## Percent Married

Percent Married is the percentage of **active** members (eligible for a death benefit) whose eligible spouse, if any, elected a survivor annuity upon the member's death. As with percent vesting, younger members often choose a refund of their contributions over any survivor annuity. This is not the case for Plan 3. For members at the older ages most spouses (and members) are eligible for death benefits.

**Old Basis:** Table based on 1989-94 Retirement System experience.

**New Basis:** Table based on 1995-2000 Retirement System experience.  
(TRS plans based on Social Security data).

<i>PERS</i>				
Percent Married*				
Age	Plan 1		Plan 2	
	Male	Female	Male	Female
20	N/A	N/A	0%	0%
25	N/A	N/A	0%	0%
30	N/A	N/A	0%	0%
35	N/A	N/A	0%	0%
40	45%	10%	5%	0%
45	55%	40%	5%	0%
50	65%	45%	20%	10%
55	70%	45%	40%	20%
60	70%	45%	65%	20%
65			65%	20%

\*Percentage of active (eligible) members with an eligible spouse, who elects a survivor annuity.

<i>TRS</i>						
<b>Percent Married*</b>						
	<b>Plan 1</b>		<b>Plan 2</b>		<b>Plan 3</b>	
<b>Age</b>	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
20	N/A	N/A	0%	0%	20%	35%
25	N/A	N/A	0%	0%	48%	63%
30	N/A	N/A	0%	0%	64%	73%
35	N/A	N/A	0%	0%	72%	75%
40	65%	55%	0%	0%	77%	76%
45	65%	55%	0%	0%	79%	76%
50	65%	45%	0%	15%	80%	76%
55	65%	45%	50%	40%	81%	72%
60	75%	35%	75%	50%	81%	67%
65			75%	67%		

*\*Percentage of active (eligible) members with an eligible spouse, who elects a survivor annuity.*

<i>SERS Plan 2/3</i>		
<b>Percent Married*</b>		
<b>Age</b>	<b>Male</b>	<b>Female</b>
20	0%	0%
25	0%	0%
30	0%	0%
35	0%	0%
40	5%	0%
45	5%	0%
50	20%	10%
55	40%	20%
60	65%	20%
65	65%	20%

*\*Percentage of active (eligible) members with an eligible spouse, who elects a survivor annuity.*

<i>LEOFF Plan 1</i>		
<b>Percent Married*</b>		
<b>Age</b>	<b>Plan 1</b>	<b>Plan 2</b>
20	N/A	0%
25	N/A	0%
30	N/A	0%
35	N/A	0%
40	60%	0%
45	60%	0%
50	60%	25%
55	60%	25%
60	60%	50%
65	60%	
70	60%	
75	60%	
80	60%	
85	60%	

*\*Percentage of (eligible) members with an eligible spouse, who elects a survivor annuity.*

<i>WSP Plan 1</i>	
<b>Percent Married*</b>	
<b>Age</b>	
20	N/A
25	N/A
30	N/A
35	N/A
40	60%
45	60%
50	60%
55	60%
60	60%
65	60%
70	60%
75	60%
80	60%
85	60%

*\*Percentage of (eligible) members with an eligible spouse, who elects a survivor annuity.*

## Certain and Life Annuities

In many of the plans the standard retirement option is a monthly benefit payable for the life of the member. If the retiree dies before the total of payments exceed member's accumulated contributions, the difference is paid to a beneficiary. For active members, this liability is valued using a certain and life annuity, where the certain period is equal to approximately the ratio of the saving fund to the annual benefit. This ratio is shown below for those plans it applies to:

<b><u>Plan</u></b>	<b><u>Years Certain</u></b>
PERS 1	3
PERS 2	3
TRS 1 Disability Benefit	11*
TRS 2	4
SERS 2	3
LEOFF 2	5

*\*Only disabled members get this without a reduction in their benefit. The certain period applies to only the "annuity" portion of their benefit, typically 30% of the total benefit.*

LEOFF 1 and WSP retire at younger ages and receive a survivor or child benefit which means the value of this guarantee is very low.



## **PERS Military Service Credit**

Members of PERS 1 may receive service credit for certain military service. A member may include up to five years of military credit in their benefit calculation after completing 25 years of retirement system service.

Forty-eight percent of males retiring with 25 or more years of service from 1996 to 2001 have an average of 37 months of military service.

One percent of females retiring with 25 or more years of service from 1996 to 2001 have an average of 35 months of military service.

## **WSP Military Service Credit**

Members of WSP may receive service credit for certain military service. A member may include up to five years of military credit in their benefit calculation after completing 25 years of retirement system service.

Recent legislation eliminates non-interruptive military service from the plan, for those commissioned after January 1, 2003.

Forty-three percent of members retiring with 25 or more years of service from 1996 to 2001 have an average of 32 months of military service. This provision can increase future benefits an average of 7-8%.

## Age Difference

The following is based on the age difference between member and beneficiary for retirements from 1995-2000:

Plan/Sex	Age Difference
PERS - Male	3
PERS - Female	-2
TRS - Male	3
TRS - Female	-2
SERS - Male	3
SERS - Female	-2
LEOFF - Male	4
LEOFF - Female	-4
WSP - Male	3
WSP - Female	-2

## IV. Economic Assumptions

Economic and growth assumptions are adopted according to RCW 41.45. These are outside the scope of this study and report.

Following is the set of assumptions to be used beginning with the 2000 actuarial valuations and continuing until changed according to RCW 41.45.

Investment Return Rate	8%
Salary Inflation Rate	4½%
Consumer Price Index	3½%

### ***Growth of Active Membership***

Growth in membership is assumed to be 1.25% annually in PERS, SERS and LEOFF. TRS is assumed to grow at .90%. This assumption is used to determine future salaries for amortizing the Unfunded Actuarial Accrued Liability.

## **V. Actuarial Valuation Method**

The Funding Statutes (Chapter 41.45 RCW ) require:

Plan 1 to be funded as a level percentage of all future pay needed to fully amortize the total cost of Plan 1 not later than June 30, 2024.

WSP, Plan 2 LEOFF and Plans 2/3 TRS, SERS and PERS will be funded using the Aggregate Actuarial Cost Method.

To satisfy these funding goals we will use a version of the Entry Age Cost Method. Under this method, the Normal Cost of benefits is determined as that contribution rate which, if paid from entry date to retirement date on behalf of the average member of the system, would fully support such member's benefits.

The employer contribution rate for each system is developed as the sum of the Normal Cost and a rate to amortize the plans 1 Unfunded Actuarial Liability as a percentage of all future pay by June 30, 2024. The Plan 2 or Plan 2/3 normal cost is used for plan 1 to create the same employer contribution rate for all members of each system.

Investment gains and losses shall be recognized equally over 4 years beginning with the 2000 actuarial valuations.

## VI. Impact on Contribution Rates

The contribution rates below compare the effect of old and new demographic assumptions on the 2000 valuation.

	Plan 1		Plan 2/3	
	2000 Valuation Demographic Assumptions		2000 Valuation Demographic Assumptions	
	Old	New	Old	New
<b>PERS</b>				
Member	6.00%	6.00%	1.05%	0.62%
Employer ( <i>Normal Cost</i> )	1.05%	0.62%	1.05%	0.62%
Employer ( <i>Plan 1 UAAL</i> )	0.58%	0.44%	0.58%	0.44%
Total Employer	1.63%	1.06%	1.63%	1.06%
<b>TRS</b>				
Member	6.00%	6.00%	*1.29%	*0.03%
Employer ( <i>Normal Cost</i> )	1.76%	0.54%	1.76%	0.54%
Employer ( <i>Plan 1 UAAL</i> )	0.62%	0.34%	0.62%	0.34%
Total Employer	2.38%	0.88%	2.38%	0.88%
<b>SERS</b>				
Member	N/A	N/A	*0.46%	*0.27%
Employer ( <i>Normal Cost</i> )	N/A	N/A	0.64%	0.46%
Employer ( <i>PERS Plan 1 UAAL</i> )	N/A	N/A	0.58%	0.44%
Total Employer	N/A	N/A	1.22%	0.90%
<b>LEOFF</b>				
Member	0.00%	0.00%	4.02%	4.37%
Employer	0.00%	0.00%	2.41%	2.62%
State ( <i>Normal Cost</i> )	0.00%	0.00%	1.61%	1.75%
State ( <i>Plan 1 UAAL</i> )	0.00%	0.00%	0.00%	0.00%
Total State	0.00%	0.00%	1.61%	1.75%
<b>WSP</b>				
Member	2.00%	2.00%	N/A	N/A
Employer ( <i>State</i> )	0.00%	0.00%	N/A	N/A

\*Applies to Plan 2 Only.

Contribution rates are expressed as a percentage of salary and are effective July 1, 2003.

The 2000 contribution rates reflect legislation enacted during the 2001 legislative sessions including the new economic assumptions (8% interest, 4.5% salary inflation).